SUMMER INTERNSHIP

AT

IIHMR, DELHI (APRIL1 TO MAY 31, 2020)

A REPORT

BY

DR. DHRUV KUMAR UPADHYAY

Post-graduate Diploma In Hospital And Health Management

2019-2021

Acknowledgement

I would like to express my special thanks of gratitude to my mentor Dr. Nishikanth Bele as well as my teachers including Dr Manish Priyadarshi, Mrs. Divya Aggarwal who gave me the golden opportunity to do this wonderful project which also helped in doing a lot of Research and I came to know about so many things.

I am really thankful to them.

Secondly I would also like to thank my parents and friends who helped me a lot in finishing this project in this limited time.

I am making this project not only for marks but to also increase my knowledge.

THANKS TO ALL WHO HELPED ME

(Completion of Summer Internship from respective organization)

DECLARATION

I DHRUV KUMAR UPADHYAY, hereby declare that this Internship Assignments entitled

a. ……..b……c……..d…….is the outcome of my own study undertaken under the guidance of Prof/ DR. Nishikant Bele, IIHMR-New Delhi. It has not previously formed the basis for the award of any degree, diploma, or certificate of this Institute or of any other institute or university. I have duly acknowledged all the sources used by me in the preparation of this field internship report.

Date:

Sign:

Postgraduate Diploma in Hospital and Health Management

International Institute of Health Management Research

New Delhi

CERTIFICATE OF COMPLETION

The certificate is awarded to

Name _____(PG/ _____[Enrollment Number]))

In recognition of having successfully completed her/ his Internship in the department of

Title _____and has successfully completed her/his Project on _____[Title of the Project]

Date_____

Organisation _____

She/ He has found to be a committed, sincere and diligent student who has a strong zeal for learning.

We wish him/her all the best for future endeavors

Dean- Academics Student Affairs

Mentor Name & Signature

FEEDBACK FORM

Name of the Student:

Summer Internship Institution:

Area of Summer Internship:

Attendance:

Objectives met:

Deliverables:

Strengths:

Suggestions for Improvement:

Signature of the Officer-in-Charge (Internship)

INDEX

TASK 1

Case report – National centre for disease contro

Introduction

National Centre for Disease Control previously known as **National Institute of Communicable Diseases**) is an institute under the Indian Directorate General of Health Services, Ministry of Health and Family Welfare. It was established in July 1963 for research in epidemiology and control of communicable diseases and to reorganize the activities of the **Malaria Institute of India** (MII).

History

The origin of NCDC can be traced back to *Central Malaria Bureau*, which was established at Kasauli, Himachal Pradesh, India in 1909. It was renamed as the Malaria Institute of India in 1938 and in 1963 renamed as the NICD.[1]

The reorganized Institute was established to develop a national centre for teaching and research in various disciplines of epidemiology and control of communicable diseases.

Branches

- the headquarter in Delhi NCDC
- Alwar (Rajasthan)
- Bengaluru (Karnataka)
- Kozhikode (Kerala)
- Coonoor (Tamil Nadu)
- Jagdalpur (Chhattisgarh)
- Patna (Bihar)
- Rajahmundry (Andhra Pradesh)
- Varanasi (Uttar Pradesh)

Leadership

- Dr Sujeet Kumar Singh, Director
- Dr. S.K. Singh Director, Hod & Npo (Idsp)
- Dr. C.S.Aggarwal Additional Director & Hod (Epidemiology Div)
- Dr. Somenath Karmakar Additional Director & Hod (Centre For Aids & Related Disease)
- Dr. Sunil Gupta Hag, Additional Director & Hod (Microbiology Div)
- Dr. Sunil Gupta Hag, Additional Director & Hod (Zoonosis Div)
- Dr. Malti Gautam Cmo (Nfsg) & Hod (Biochemistry Div)
- Dr. Sandhya Kabra(Micro) Additional Director & Hod (Viral Hepatitis Lab)

- Dr. Sandhya Kabra Additional Director & Hod (Bio Technology Div)
- Dr. Anshu Sharma Cmo (Hag),Additional Director & Hod (Non Communicable Disease Div)
- Dr. S. K. Jain Additional Director & Hod (Parasitic Disease Div)

Division

NCDC has fourteen technical centres/divisions under it namely

- Centre for AIDS and Related Diseases
- Division of Epidemiology
- Centre for Medical Entomology & Vector Management
- Division of Biochemistry and Toxicology
- Division of Malariology & Coordination
- Division of Microbiology
- Division of Statistical Monitoring & Evaluation
- Division of Parasitic Diseases
- Division of Zoonosis
- Centre for Environmental and Occupational Health
- Centre for Non-Communicable Diseases
- Integrated Disease Surveillance Programme

Services

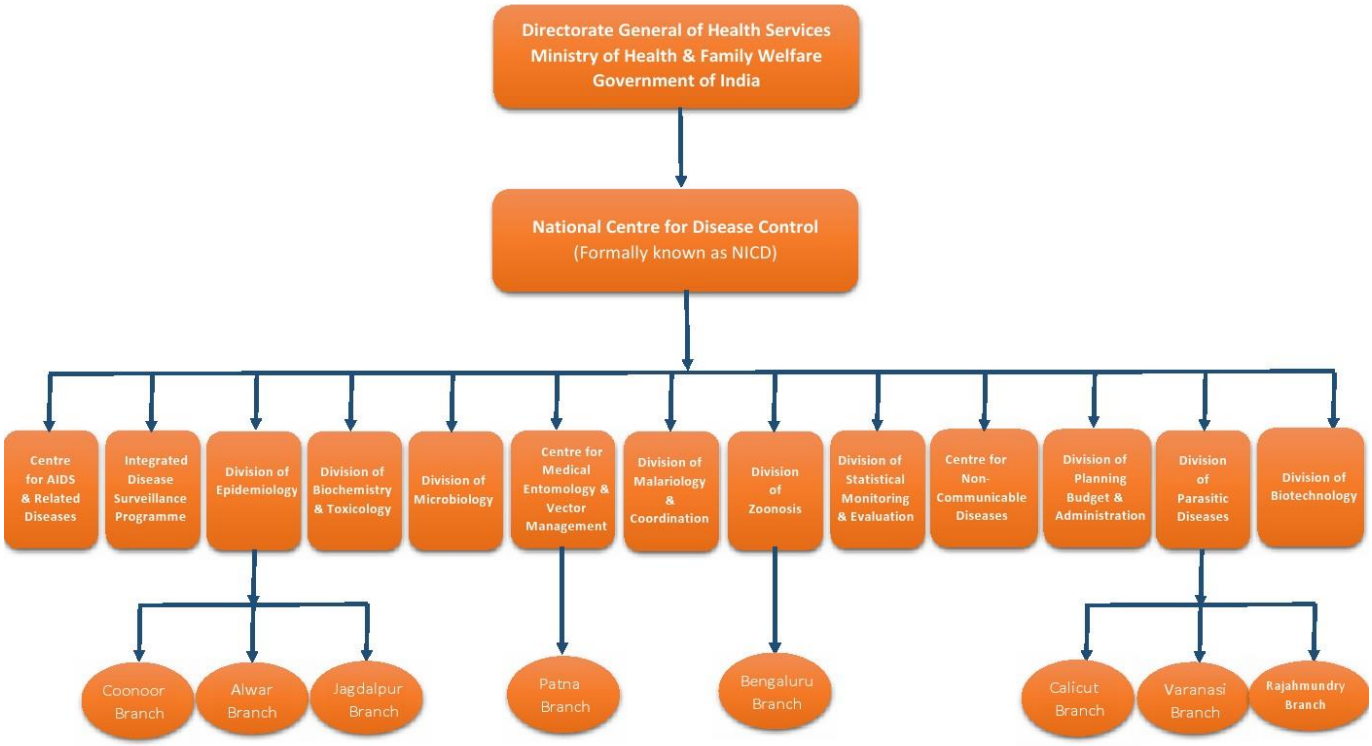
- Outbreak investigations & recommendations on control measures for the out-break of various communicable diseases in the States/UTs all over the country
- Referral Diagnostic Services for various communicable diseases of microbial origin specially for those for which diagnostic facilities are ordinarily not available in hospitals and medical colleges:
- Other important services like Quality Control of Biologicals, Storage and supply of reagents, test kits and vaccines on behalf of the Directorate General of Health Services (DGHS) vaccines and other biological materials,Entomological investigations, Evaluation of chemical compounds & Assessment of biochemical parameters to establish clinical diagnosis e.g. Thyroid function tests etc.

Manpower

The NCDC at its headquarter has 58 Group A officers (Central Health Services and Non-Medical Scientists), 10 Group B (Gazetted), 111 Group B (Non-Gazetted) and

137 Group C officials besides about 37 contractual consultants/support staff. The existing eight NCDC branches have 81 officials.

Organogram



Programmes

Integrated Disease Surveillance Programme (IDSP)

It was launched in project mode with World Bank assistance in November 2004 for 5 years. The project was extended for 2 years up to March 2012. The project continues in the 12th Plan with domestic budget as Integrated Disease Surveillance Programme under NHM for all States at an outlay of Rs 640.40 crores. Currently the programme conducts surveillance of 18 outbreak prone diseases.

Programme Components

- Integration and decentralization of surveillance activities through establishment of surveillance units at Centre, State and District level.

- Human Resource: Training of State Surveillance Officers, District Surveillance Officers, Rapid Response Team and other Medical and Paramedical staff on principles of disease surveillance.
- Use of IT for collection, collation, compilation, analysis and dissemination of data.
- Strengthening of public health laboratories.
- Inter-sectoral co-ordination for zoonotic diseases

Yaws Eradication Programme (YEP)

Yaws Eradication Programme (YEP): This programme was launched as a centrally sponsored scheme in 1996-97 in Koraput district of Orissa, which was subsequently expanded to cover all the 51 Yaws endemic districts in ten states (Andhra Pradesh, Telengana, Orissa, Maharashtra, Madhya Pradesh, Chhattisgarh, Tamil Nadu, Uttar Pradesh, Jharkhand, Assam and Gujarat). The programme aimed to reach the un-reached tribal areas of the country

The programme envisaged achieving its objective through adopting following strategies: ¬ Case finding: active case search, passive surveillance, rumour reporting ¬ Treatment of cases and contacts ¬ Manpower development ¬ IEC activities ¬ Multi-sectoral approach ¬ Sero –survey in 1-5 year children

The programme envisaged achieving its objective through adopting following strategies: ¬ Case finding: active case search, passive surveillance, rumour reporting ¬ Treatment of cases and contacts ¬ Manpower development ¬ IEC activities ¬ Multi-sectoral approach ¬ Sero –survey in 1-5 year children

NCDC budget 2016-17

NCDC has a staff of 434 officers and officials.[2] The budget allocation for the fiscal year 2017 was ₹233.04 crores (approx. $35 million)

s.no	Name of the Scheme	BE	RE	Exp
1	NCDC (Main Institution- NP+Plan)	5658	4384	4134.15
2	NCDC (Upgradation) (Revenue)	200	83	35.26
	NCDC (Upgradation) (Revenue)	2620	2620	2614
3	Estt. of 30 branches branches (Incuding 8 existing branches of NCDC) in all States and one UT			

	Revenue	200	25	26.54
	Capital	386	100	0
4	National Rabies Control Programme	824	824	343.84
5	Leptospirosis Control Programme	65	65	8.14
6	Coordination of Prevention and control of Zoonotic Diseases	75	28	14.30
7	Viral Hepatitis	262	27	0.12
8	Anti Micro Resistance	158	100	83.25
	total	10488	8256	7259.60

TASK 2

Integrated disease surveillance programme (idsp)

Headed by **dr. Sujeet kumar singh, director, ncdc**

Mission

To strengthen the disease surveillance in the country by establishing a decentralized state based surveillance system for epidemic prone diseases to detect the early warning signals, so that timely and effective public health actions can be initiated in response to health challenges in the country at the districts, state and national level.

Introduction

Integrated disease surveillance programme (idsp) was launched with world bank assistance in november 2004 to detect and respond to disease outbreaks quickly. The project was extended for 2 years in march 2010 i.e. From april 2010 to march 2012, world bank funds were available for central surveillance unit (csu) at ncdc & 9 identified states (uttarakhand, rajasthan, punjab, maharashtra, gujarat, tamil nadu, karnataka, andhra pradesh and west bengal) and the rest 26 states/uts were funded from domestic budget. The programme continues during 12th plan (2012-17) under nhm with outlay of rs. 640 crore from domestic budget only.

- Surveillance units have been established in all states/districts (ssu/dsu). Central surveillance unit (csu) established and integrated in the national centre for disease control, delhi.
- Training of state/district surveillance teams and rapid response teams (rrt) has been completed for all 35 states/uts.
- A 24x7 call center was established in february 2008 to receive disease alerts on a toll free telephone number (1075). The information received is provided to the states/districts surveillance units for investigation and response.

Objectives:

• to strengthen/maintain decentralized laboratory-based it enabled disease surveillance system for epidemic-prone diseases to monitor disease trends and to detect and respond to outbreaks in early rising phase through trained rapid response team (rrts).

Programme components:

• integration and decentralization of surveillance activities through the establishment of surveillance units at centre, state and district level.

• human resource development – training of state surveillance officers, district surveillance officers, rapid response team and other medical and paramedical staff on principles of disease surveillance.

• use of information communication technology for collection, collation, compilation, analysis and dissemination of data.
• strengthening of public health laboratories.
• inter sectoral co-ordination for zoonotic diseases

Diseases under surveillance: laboratory confirmed (l form)

1. Dengue / dhf / dss
2. Je
3. Meningococcal meningitis
4. Typhoid fever
5. Diphtheria
6. Cholera
7. Shigella dysentery
8. Viral hepatitis a
9. Viral hepatitis e
10. Leptospirosis
11. Malaria
    - pv:
    - pf:

Diseases under surveillance: presumptive (p form)

1. Acute diarrhoeal disease (including acute gastroenteritis)
2. bacillary dysentery
3. viral hepatitis
4. enteric fever
5. malaria
6. dengue / dhf / dss
7. chikungunya
8. acute encephalitis syndrome
9. meningitis
10. measles
11. diphtheria
12. pertussis
13. chicken pox
14. fever of unknown origin (puo)
15. acute respiratory infection (ari) / influenza like illness (ili)
16. pneumonia

17. leptospirosis
18. acute flaccid paralysis < 15 years of age
19.19 dog bite
20. snake bite
21. any other state specific disease (specify) 22 unusual syndromes not captured above (specify clinical diagnosis)

Organisation structure

Central surveillance unit (csu): integrated administratively and financially with national centre for disease control (ncdc), delhi

State surveillance unit (ssu): one in each state/ut with a regular officer identified as state surveillance officer (sso). Supported by 7 contractual staff. Con (vet) added in 2013-14

District surveillance unit (dsu): one in each district with a regular officer as district surveillance officer (dso). Supported by 3 contractual staff

Idsp organisation structure

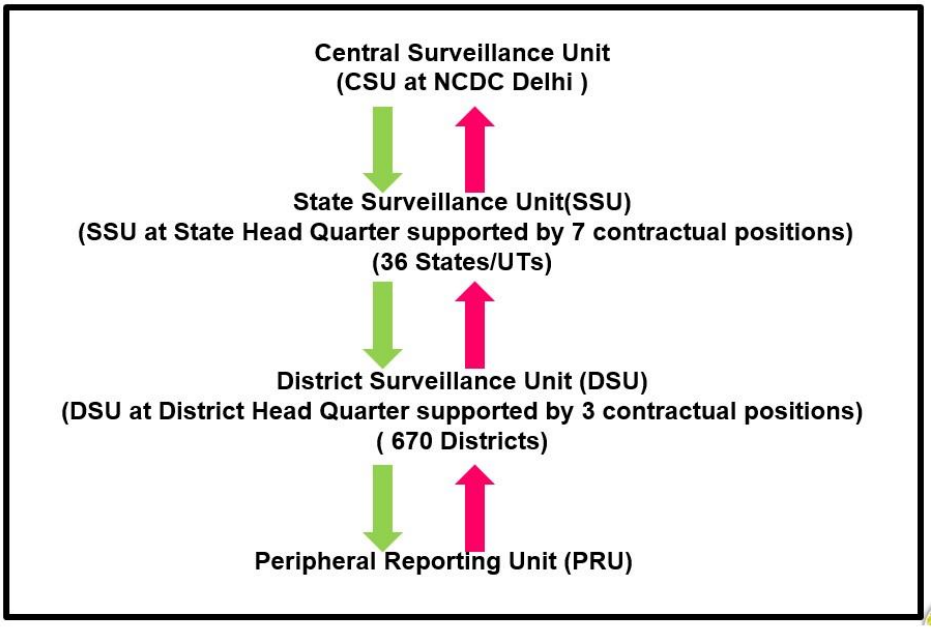


table 13.1 : Year-wise Budget Estimate, Revised Estimate & Expenditure under IDSP

(Rs. in Crore)

Year	Budget Estimate	Revised Estimate	Exp./Release of GIA to States
2004-05	27.00	44.00	25.01
2005-06	48.50	50.00	39.26
2006-07	102.00	36.86	12.93
2007-08	80.00	55.00	41.36
2008-09	72.00	30.00	21.75
2009-10	48.50	42.50	39.95
2010-11*	35.00	54.40	48.98
2011-12	63.00	45.00	27.83
2012-13	63.00	40.00	33.11
2013-14**	63.00	50.00	49.96
2014-15	63.00	70.00	55.65
2015-16	64.35	64.75	64.63
2016-17	68.35	68.35	63.05
2017-18(upto 31st October, 2017)	68.35	-	31.44

DATA MANAGEMENT

Integrated Disease Surveillance Project aims at collecting, compiling, analyzing and using data on various target diseases for surveillance and rapid response to prevent or control spread of diseases in the communities. As data are computerized, it becomes necessary to standardize formats used for recording and reporting information at various levels. Under IDSP, data are collected on epidemic prone diseases on weekly basis (Monday–Sunday).

The following Formats (Annexure 1) were used under IDSP initially:

'S' form - Reporting Format for Syndromic Surveillance, filled by Health Worker.

'P' form- Reporting Format for Presumptive Surveillance, filled by Medical Officer.

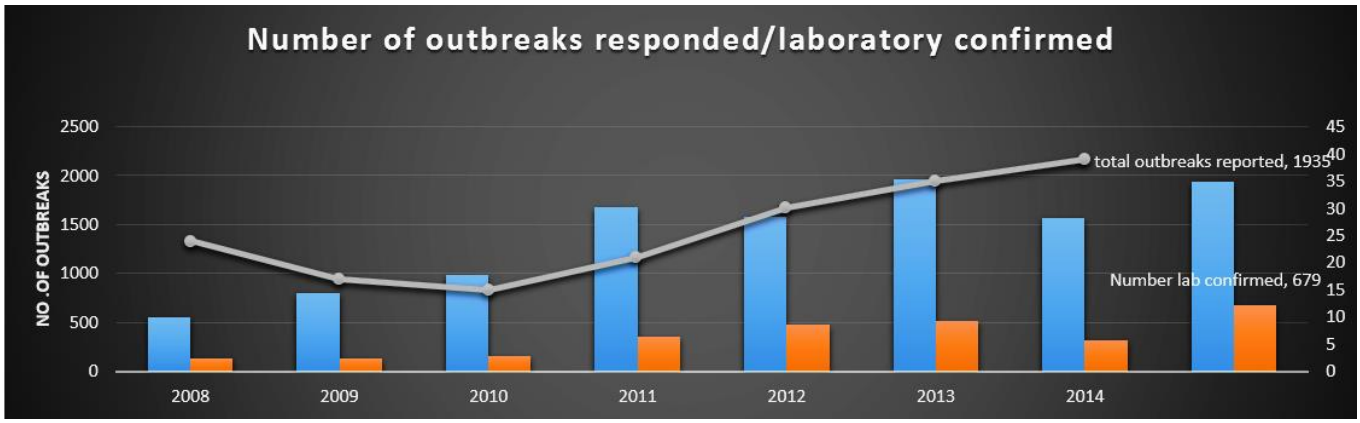
'L1, L2, L3' forms - Reporting Format for Laboratory Surveillance.

'W' form - Reporting Format for Water Quality Monitoring, filled by Health Workers and Laboratory Personnel at PHCs, CHCs and in various other laboratories in the district.

WEEKLY OUTBREAK SURVEILLANCE

One of the most important objectives of IDSP is strengthening of Disease Surveillance System for epidemic prone diseases to detect and respond to outbreaks. CSU, IDSP receives disease outbreak reports from all the 36 States/UTs on weekly basis through its IDSP portal viz www.idsp.nic.in. Even NIL weekly reporting is mandatory.

Graph depicting the number of outbreaks responded to and lab confirmed outbreaks



Administrative Structure

Central Surveillance Unit

A senior officer from NCDC (Additional Director level) is designated as National Programme Officer (NPO), to coordinate the project activities under six sections namely Budget & Finance, Laboratory strengthening, Information Technology and Communication, Data Management and Monitoring, Human Resource Development and NCD Surveillance. This arrangement facilitated utilizing the services of Epidemiologists, Microbiologists and Statistical officers of NCDC to support the NPO in ensuring enhanced technical support, improved state oversight and troubleshooting

State and District Surveillance Units[edit]

The contractual positions initially sanctioned for SSU were Consultant (Training), Consultant (Finance & Procurement), Data Manager, Data Entry Operators, Office Assistant and Class IV staff. The contractual positions sanctioned for DSU were Data Manager, Data Entry Operator and Account/Administrative Assistant. Later on some of the posts were discontinued like Account/Administrative Assistant. In 2008 a total of 766 positions were sanctioned (Epidemiologists, Microbiologists, and Entomologist) to be appointed at state and district headquarters on contractual basis, to strengthen the capacity for implementation of IDSP

Types of training under IDSP

- TOT- Six days TOT programme is being designed for health personnel and members of rapid response team. Subjects covered in these training programmes are Introduction to surveillance with special reference to IDSP, basic epidemiology, collection and transmission of laboratory specimens and biosafety issues and details in response to outbreaks. A total of 2956 members of RRTs have been trained till date.
- FETP- It is a two-week-long training course designed to train DSOs/ Epidemiologists to enhance their epidemiological skills in outbreak investigations. Though FETP programmes, total 756 DSOs have been trained throughout the country till April 2016.
- Other types of training include Induction training of Microbiologists, Entomologists, finance consultant and other support staff under IDSP.

TASK 3

Task 3

Introduction

Zoonotic diseases are caused by either totally new or partially new agents or by microorganisms previously known but now occurring in places or in species where the disease was previously unknown or totally unsuspected places. Zoonotic diseases are responsible for majority of outbreaks all around the globe. Several factors have led to the emergence of these infections, including human demographics, the industrialization of food production, globalization, international travel and commerce, land use, microbial adaptation, and changes and breakdown in public health measures. Several zoonotic agents are also potential agents that could be used as biological weapons. The examples for these claims should be recent use of anthrax spores in tainted mail in the US, it underlines our need for preparedness against bioterrorism.

Prevention and control of these emerging zoonotic diseases is based on recognition, investigation, and collaboration, the development of advanced diagnosis and surveillance tools, the use of applied epidemiology and molecular biology methods, as well as education, information, communication, and technology transfer.

AIM: To study and highlight the factors that could be helpful in controlling and prevention of zoonotic diseases.

Methodology: The study reviewed various literatures based on internet search using various databases like Google Scholar, Pubmed, Medline and Scihub. The articles using specific keywords were searched and 5 articles were considered based on their relativity published in last 10 years.

Result: on the basis of various literatures available it is safe to say that not only we can prevent and control but we can also monitor(on the global level) and also somewhat predict the future zoonotic pandemic.

Keywords: Zoonotic diseases, zoonotic agents, biological weapons

Articles reviewed:

1. Control and Prevention of Emerging Zoonoses by Bruno B. Chomel

   This study is based on the control and prevention of zoonotic diseases, in this study factors responsible for emergence of zoonotic diseases such as demography, international travels, globalization, microbial resistance are taken under consideration.
   To prevent the spread of zoonotic diseases factors like medium of spread (like food borne zoonoses) need to be understood.
   For prevention of such condition this article have focused on factors like; recognition, investigation and collaboration(between field teams and laboratories), Advance structures for Diagnosis and surveillance, education and training and communication.

2. Prediction and prevention of the next pandemic zoonosis by Stephen S Morse, Jonna A K Mazet, Mark Woolhouse, Colin R Parrish, Dennis Carroll, William B Karesh, Carlos Zambrana-Torrelio, W Ian Lipkin, Peter Daszak
   This article discuss about the pathogens that emerge, the hosts that they originate in, and the factors that drive their emergence. It also discuss challenges to their control and new efforts to predict pandemics, target surveillance to the most crucial interfaces, and identify prevention strategies.

3. Research Options for Controlling Zoonotic Disease in India, 2010–2015 by Nitin Sekar, Naman K. Shah, Syed Shahid Abbas, Manish Kakkar
   In this research study the methodology developed by the Child Health and Nutrition Research Initiative i.e CHNRI has been adapted.
   The major methodological advance in CHNRI was two-fold. First, the systematic listing and scoring of competing research options. Second, by weighting scoring criteria based on the values of a reference group.
   This study also focuses on Eleven major zoonotic diseases, or classes of diseases, were accorded priority status in India by our expert group and on the limitations such as limited research options.

4. Reports of zoonotic disease outbreaks associated with animal exhibits and availability of recommendations for preventing zoonotic disease transmission from animals to people in such settings by Jeff B. Bender, DVM, MS, DACVPMStephanie A. Shulman
   The design of this study is literature review and survey of state public health veterinarians and state epidemiologists.
   This study talks about major setbacks such as there is no major written guidelines and recommendation for control of zoonotic diseases.

5. Inter-Sectoral coordination for Prevention and Control of Zoonotic Diseases
   This is the program run by government of India from 2012-2017 to strengthen the Inter-sectoral for prevention and control of Zoonotic diseases of Public Health Importance.
   Strategies of the programme are:
   - Strengthening of inter-sectoral co-ordination between Medical , Veterinary, wildlife sector and various relevant stakeholders for prevention and control of zoonotic diseases
   - Trained manpower development
   - Sensitization of professionals in various sectors (i. Medical , Veterinary etc .)
   - IEC to create awareness among community.

This program is continuing under Umbrella Scheme of NCDC (Part B)

Activities undertaken in last one year i.e. 2018-19 – are

- Interectoral coordination- To institutionalize the “ONE HEALTH” approach at National level – Collaboration with DADF, Ministry of Agriculture and Farmer Welfare (MoA & amp ;FW) for development of technical guidelines for animal component of rabies control has been done. MoU is proposed to be signed between DADF, MoA & amp; FW, MoH & amp; FW, Wild life institute of India for prevention and control of Zoonotic Disease in India including rabies.
- State & District level initiatives- 14 States constituted State Level Zoonosis Committee (SLZC) for intersectoral coordination for prevention and control for zoonosis. Formation of district level committee zoonosis committee is under progress . Follow up is being done with rest other
- Technical support activities- Organized a two day “National Multi Stakeholder Technical Workshop for strengthening inter-sectoral coordination for prevention and control of zoonotic diseases are being formulated with stakeholders and State
- IEC activities - Communication was made with all states/UTS to observe World zoonosis day observed for raising awareness of medical and vet.

TASK 4

Introduction

During times of crisis/emergencies hospitals play an integral role within the health care delivery system by providing necessary health care to their community. In recent years, severe smog that blanketed many Indian cities mainly NCR in the months of March and April and in autumn season, living in smog has become "normal" to most people living in NCR. This has not only caused serious harm to public health, but also resulted in massive economic losses in many other ways. Developing of a preparedness plan for managing the patient load during air pollution has become crucial to India's long-term economic and social sustainable development.

Hospital Preparedness

It incorporate all those measures taken before a disaster or crisis event which are aimed at minimizing loss of life, disruption of critical services and damages. In this report we will talk about Hospital preparedness plan during air pollution crisis.

Why do we need a preparedness plan?

Preparedness is a protective process which enables governments, communities and individuals to respond rapidly to disaster situation and cope with them effectively. Preparedness includes development of emergency response plans, effective warning systems, maintenance of inventories, training of manpower etc.
Without appropriate planning, local health system can easily be overwhelmed in attempts to provide care because of the following reasons:

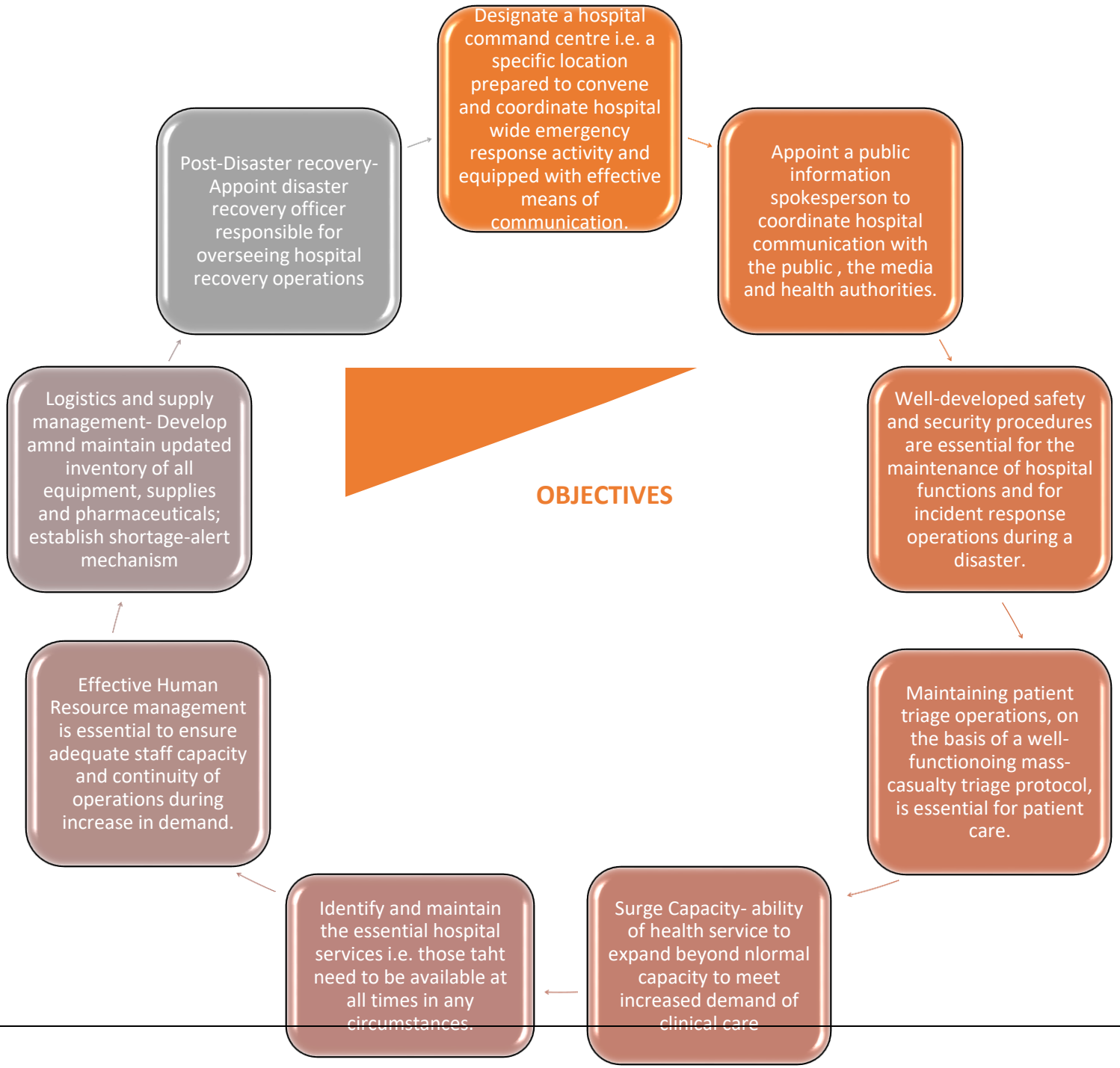
- Unpredictability
- Under and unpreparedness
- Lack of resources
- Lack of manpower
- Lack of funds
- Inaccessibility

Aim

The aim of a hospital preparedness plan is to provide prompt and effective medical care to the maximum possible, in order to reduce the patient surge.

Why it is important in present condition?

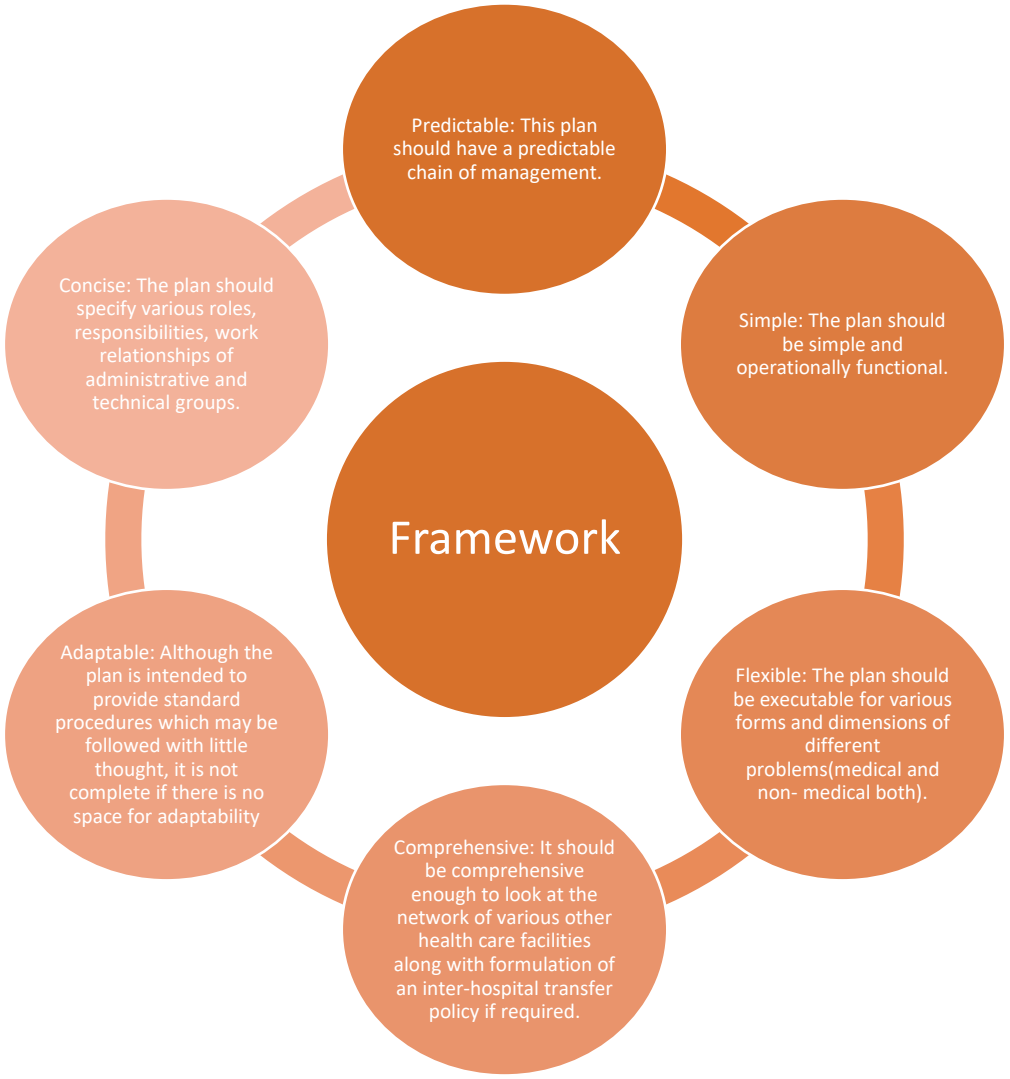
- It will help in reducing the number of patients visiting respiratory OPD.
- According to Global Burden of Disease (GBD) 2010 Project, air pollution ranked as a leading contributor to the burden of disease in South Asia. Estimates of the burden in India show approximately 1.04 million premature deaths and 31.4 million disability-adjusted life years (DALYs)
- Many doctors claim that in recent years the number of patients having respiratory problems have shot up by 25 to 30 per cent.
- On an average 85 patients visited daily in the respiratory unit of the hospital
- Last few decades have witnessed an increased frequency in disasters
- causing tremendous human casualties, in terms of loss of life and disability because of change in environment.
- Recurrent outbreaks of Respiratory diseases.
- To reduce the burden of diseases (approximately 10.2% of total deaths every year because of chronic respiratory disease).
- Pollution is if the leading cause for a sudden increase in the number of patients of respiratory diseases. Air pollution is also expensive for us economically – it cost the country the equivalent of 8.5 percent of its GDP in 2013.


Designate a hospital command centre i.e. a specific location prepared to convene and coordinate hospital wide emergency response activity and equipped with effective means of communication.
Appoint a public information spokesperson to coordinate hospital communication with the public , the media and health authorities.
Well-developed safety and security procedures are essential for the maintenance of hospital functions and for incident response operations during a disaster.
Maintaining patient triage operations, on the basis of a well-functionoing mass-casualty triage protocol, is essential for patient care.
Surge Capacity- ability of health service to expand beyond nlormal capacity to meet increased demand of clinical care
Identify and maintain the essential hospital services i.e. those taht need to be available at all times in any circumstances.
Effective Human Resource management is essential to ensure adequate staff capacity and continuity of operations during increase in demand.
Logistics and supply management- Develop amnd maintain updated inventory of all equipment, supplies and pharmaceuticals; establish shortage-alert mechanism
Post-Disaster recovery- Appoint disaster recovery officer responsible for overseeing hospital recovery operations
OBJECTIVES

Goals

- The major goal of this plan is to manage the patient load and revert the situation to normal which will then bring patient surge to minimal.
- To control a large number of patients and manage the resulting problems in an organized manner.
- To provide proper diagnosis and treatment to the patients.
- Will be helpful in reducing the Panic among people.
- Building Public Awareness and Community Outreach to communicate the risks of air pollution and implement practices to prevent pollution related deaths and illnesses.
- Initiating an Early Warning System and Inter-Agency Coordination to alert residents of predicted extreme AQI levels.
- Capacity Building Among Health Care Professionals to recognize and respond to related illnesses, particularly during extreme polluted events (like faced in

Framework



November 2019). Such trainings focus on primary medical officers, paramedical staff, so that these experts can effectively prevent and manage cases and reduce mortality and morbidity.

Structure of hospital preparation plan

To make the proceedings easier it is recommended that the hospital administrators embark upon disaster planning using a phase plan. The hospital emergency planning can be divided into three phases:

1) Pre disaster phase

a) Planning: Most of the assessment, planning and prediction is done in the pre disaster phase, the hospital plans are formulated and then discussed in a suitable forum for approval. As for the current plan we can easily predict when there will be sudden increase in number of patients from previous knowledge.

b) The disaster manual: The hospital plan should be written down in a document form which will include the preparation plan to deal with the patient surge.

c) Planning for managing the patients: Plan to manage the high-risk patient and the areas with patient surge should be prepared.

d) Zoning and colour code: The areas with high AQI value should be divided into zones on the basis of AQI value of that area and on the number of patients reported in that area. So, we may have a general idea about the areas where the patient load will be higher.

AQI level	Scale
0-50	Good
50-100	Moderate
100-150	Unhealthy for sensitive group
150-200	Unhealthy
200-300	Very unhealthy
300-500	Hazardous

The Good and Moderate should come under Green zone i.e. no to minimal level of patients

The Unhealthy for sensitive group and Unhealthy should come under Yellow zone i.e. moderate number of patients, more than normal level.

The very unhealthy and Hazardous should come under Red zone i.e. Maximum number of patients, patient surge.

A list of all areas according to this should be prepared and constantly updated.

e) Identify areas of vulnerable populations and also the areas with high AQI, in part by utilizing the list of high-risk areas.

f) Calculate the number of Hospitals and health care service providers in the High-risk areas and act accordingly.

g) Staff education and training: The staff should know about and get trained in using the hospital disaster/emergency manual. Regular staff training should be undertaken in this phase.

h) Hospital admissions and emergency case records should be updated and air pollution-related morbidity and mortality should be tracked and existing databases of air pollution-related morbidity and mortality should be updated.

i) Inventory should be updated just before the disaster phase.

2) Disaster Phase

a) Phase of activation: Notification of emergency. The hospitals in Yellow and Red zone should be in primary focus.

b) Activation of the chain of command in the hospital.

c) Monitor and increase the zones when necessary to match the severity of the forecast and threshold established and alerts the concerned authorities to convene a special meeting with key agency leaders.
d) Expand the access in target areas i.e Red zone.
e) The Hospitals in Red zone should be of prime concern for the authorities.
f) As per the design High risk patients should be prioritized.
g) Operational phase: This is the phase in which the actual tackling of mass casualties is performed as per the plan.
h) Phase of deactivation: An important phase of the hospital emergency plan when the administration of the hospital is satisfied that the influx of mass casualty victims is not continuing to overwhelm the hospital facilities.

3) Post Disaster Phase

This an important phase of were the activities can and will be discussed and the inadequacies and flows are noted for future improvements. Planning for the changes is done.

Checklist for Hospital Administration
Pre-Autumn And March - April

- Adopt respiratory OPD-focused examination materials.
- Get additional hospitals and ambulances ready.
- Additional inventory
- Update the information provided by surveillance programs, including the daily air-pollution related data
- Establish more clinician education
- Continue to train medical officers and paramedics
- Prediction of the cases asper zones.
- Monitor the air quality

During the Event

- Adopt pulmonary-illness related treatment and prevention protocols
- Equip hospitals with additional materials
- Deploy all medical staff to be on duty
- Keep emergency ward ready
- Number of bed should be adjusted accordingly in different zones.
- All the zones should have services as per the necessity
- High risk patient's priority
    - Monitor pollution related illnesses specially because of CO, NO2 etc.
    - Monitoring of Red and yellow zones.
    - Keep stock of oxygen and emergency drugs.
    - Report the patients to concern authorities daily
    - Expedite recording of cause of death certificates

Post-Event Evaluation

- ❖ Participate in annual evaluation of hospital preparedness plan
- ❖ Review revised heat action plan

Benefits of Hospital preparedness plan

A. We can enhance the capacities of admission and treatment.

B. We can ensure proper treatment for all patients who were already present in the hospital.

C. We can easily deal with a huge number of patients.

D. Smooth handling of all additional tasks.

E. We can have necessary equipment at our disposal at the time of need.

F. We will have adequate of resources at our disposal i.e man power and other resources.

G. The staff will be well oriented towards their duties.

H. We can also expect the help from outside in optimal way.

I. If we can re-establish an orderly situation in hospital then we can enable to normal working conditions as soon as possible.

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